AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims

1-14. (Canceled)

15.   (Currently Amended)   A method of providing multiple simultaneous services through a single broadband connection to an end user, said end user being connected to a core network through first and second independently tagged Virtual Local Area Network (VLAN) regions, said method comprising the steps of:

implementing a VLAN Mapping Point at a border between the first and second VLAN regions, wherein the first VLAN region is on a first side of the VLAN Mapping Point toward the end user, and the second VLAN region is on a second side of the VLAN Mapping Point toward the core network;

receiving in the VLAN Mapping Point, an upstream traffic packet from the first VLAN region;

upon receiving the upstream packet:

mapping in the VLAN Mapping Point, a VLAN tag for the first VLAN region to a VLAN tag for the second VLAN region; and

forwarding the upstream traffic packet to the core network using the VLAN tag for the second VLAN region;

receiving in the VLAN Mapping Point, a downstream traffic packet from the second VLAN region;

upon receiving the downstream packet:

determining whether the downstream traffic packet is a unicast packet or a multicast packet;

upon determining that the downstream traffic packet is a unicast packet:

extracting from the unicast downstream packet, a destination Media Access Control (MAC) address and the VLAN tag for the second VLAN region;

obtaining the VLAN tag for the first VLAN region from a table in the VLAN mapping point by matching the extracted MAC address and the VLAN tag for the second VLAN region to a corresponding VLAN tag for the first VLAN region; and

forwarding the downstream traffic packet to the end user using the VLAN tag for the first VLAN region;

upon determining that the downstream traffic packet is a multicast packet:

obtaining from the table, a common VLAN tag for all end users in the first VLAN region; and

mapping in the VLAN Mapping Point, a VLAN tag for the second VLAN region to a VLAN tag for the first VLAN region; and

forwarding the traffic to the end user downstream traffic packet to all end users in the first VLAN region using the common VLAN tag for the first VLAN region.

16-20. (Canceled)

21.   (Currently Amended) The method of claim 18, wherein the step of obtaining the VLAN tag for the first VLAN region from a table in the VLAN Mapping Point also includes the steps of: A method of providing multiple simultaneous services through a single broadband connection to an end user, said end user being connected to a core network through first and second independently tagged Virtual Local Area Network (VLAN) regions, said method comprising the steps of:

implementing a VLAN Mapping Point at a border between the first and second VLAN regions, wherein the first VLAN region is on a first side of the VLAN Mapping Point toward the end user, and the second VLAN region is on a second side of the VLAN Mapping Point toward the core network;

receiving in the VLAN Mapping Point, an upstream traffic packet from the first VLAN region;

upon receiving the upstream packet:

mapping in the VLAN Mapping Point, a VLAN tag for the first VLAN region to a VLAN tag for the second VLAN region; and

forwarding the upstream traffic packet to the core network using the VLAN tag for the second VLAN region;

receiving in the VLAN Mapping Point, a downstream traffic packet from the second VLAN region;

upon receiving the downstream packet:

determining whether the downstream traffic packet is a unicast packet or a multicast packet;

upon determining that the downstream traffic packet is a unicast packet:

extracting from the unicast downstream packet, a destination Media Access Control (MAC) address and the VLAN tag for the second VLAN region;

obtaining the VLAN tag for the first VLAN region from a table in the VLAN mapping point by matching the extracted MAC address and the VLAN tag for the second VLAN region to a corresponding VLAN tag for the first VLAN region; and

forwarding the downstream traffic packet to the end user using the VLAN tag for the first VLAN region;

upon determining that the downstream traffic packet is a multicast packet[[,]]:

extracting an aggregate VLAN tag from the multicast downstream packet;

determining a number of entries in the table for which VLAN tags for the first VLAN region are associated with the extracted aggregate VLAN tag; and

duplicating the downstream traffic packet for each of the entries in the table for which a VLAN tag for the first VLAN region is associated with the extracted aggregate VLAN tag;

wherein changing by the VLAN Mapping Point, changes the VLAN ID in each of the duplicated downstream traffic packets to include a different one of the associated VLAN tags for the first VLAN region[[,]]; and

forwards forwarding the duplicated downstream traffic packets to end users using the associated VLAN tags for the first VLAN region.

22.　(Currently Amended)　The method of ~~claim 15~~ claim 21, wherein the first VLAN region is a last-mile network connecting the end user to the VLAN Mapping Point, and the second VLAN region is an aggregation network connecting a Layer 2 termination point to the VLAN Mapping Point.

23.　(Previously Presented)　The method of claim 22, wherein the VLAN tag for the first VLAN region is a VLAN-per-user-per-service tag, and the VLAN tag for the second VLAN region is a VLAN-per-service tag.

24.　(Currently Amended)　A Virtual Local Area Network (VLAN) Mapping Point implemented at a border between first and second independently tagged VLAN regions, wherein the first VLAN region is on a first side of the VLAN Mapping Point toward an end user, and the second VLAN region is on a second side of the VLAN Mapping Point toward a core network, said VLAN Mapping Point comprising:

a first interface for receiving upstream traffic packets from the first VLAN region, and for sending downstream traffic packets to the first VLAN region;

a second interface for receiving downstream traffic packets from the second VLAN region, and for sending upstream traffic packets to the second VLAN region; and

a mapping function connected to the first and second interfaces that, upon receiving from the first interface an upstream traffic packet that includes a VLAN tag for the first VLAN region, maps the VLAN tag for the first VLAN region to a VLAN tag for the second VLAN region, and sends the mapped upstream traffic packet to the second interface, and, upon receiving from the second interface a downstream traffic packet that includes a VLAN tag for the second VLAN region, maps the VLAN tag for the second VLAN region to a VLAN tag for the first VLAN region, and sends the mapped ~~upstream~~ downstream traffic packet to the ~~second~~ first interface, wherein the mapping function includes:

a mapping table that matches VLAN tags for the first VLAN region to associated VLAN tags for the second VLAN region, and matches VLAN tags for the second VLAN region to associated VLAN tags for the first VLAN region;

means for determining whether a received downstream traffic packet is a unicast packet or a multicast packet;

responsive to determining that the downstream traffic packet is a unicast packet:

means for extracting a destination Media Access Control (MAC) address from the unicast downstream packet;

means for obtaining the VLAN tag for the first VLAN region from the mapping table by matching the extracted MAC address to a corresponding VLAN tag for the first VLAN region; and

means for forwarding the downstream traffic packet to the end user using the VLAN tag for the first VLAN region;

responsive to determining that the downstream traffic packet is a multicast packet:

means for obtaining from the mapping table, a common VLAN tag for all end users in the first VLAN region; and

means for forwarding the downstream traffic packet to all end users in the first VLAN region using the common VLAN tag for the first VLAN region.

25-28. (Canceled)

29.   (Currently Amended) ~~The VLAN Mapping Point of claim 27, wherein the mapping function also includes:~~ A Virtual Local Area Network (VLAN) Mapping Point implemented at a border between first and second independently tagged VLAN regions, wherein the first VLAN region is on a first side of the VLAN Mapping Point toward an end user, and the second VLAN region is on a second side of the VLAN Mapping Point toward a core network, said VLAN Mapping Point comprising:

a first interface for receiving upstream traffic packets from the first VLAN region, and for sending downstream traffic packets to the first VLAN region;

a second interface for receiving downstream traffic packets from the second VLAN region, and for sending upstream traffic packets to the second VLAN region; and

a mapping function connected to the first and second interfaces that, upon receiving from the first interface an upstream traffic packet that includes a VLAN tag for

the first VLAN region, maps the VLAN tag for the first VLAN region to a VLAN tag for the second VLAN region, and sends the mapped upstream traffic packet to the second interface, and, upon receiving from the second interface a downstream traffic packet that includes a VLAN tag for the second VLAN region, maps the VLAN tag for the second VLAN region to a VLAN tag for the first VLAN region, and sends the mapped downstream traffic packet to the first interface, wherein the mapping function includes:

a mapping table that matches VLAN tags for the first VLAN region to associated VLAN tags for the second VLAN region, and matches VLAN tags for the second VLAN region to associated VLAN tags for the first VLAN region;

means for determining whether a received downstream traffic packet is a unicast packet or a multicast packet;

responsive to determining that the downstream traffic packet is a unicast packet:

means for extracting a destination Media Access Control (MAC) address from the unicast downstream packet;

means for obtaining the VLAN tag for the first VLAN region from the mapping table by matching the extracted MAC address to a corresponding VLAN tag for the first VLAN region; and

means for forwarding the downstream traffic packet to the end user using the VLAN tag for the first VLAN region;

~~means~~ responsive to determining that the downstream traffic packet is a multicast packet[[,]]:

means for extracting an aggregate VLAN tag from the multicast downstream packet;

means for determining a number of entries in the table for which VLAN tags for the first VLAN region are associated with the extracted aggregate VLAN tag; ~~and~~

means for duplicating the downstream traffic packet for each of the entries in the table for which a VLAN tag for the first VLAN region is associated with the extracted aggregate VLAN tag;

~~wherein the VLAN Mapping Point replaces~~ <u>means for replacing</u> the VLAN ID in each of the duplicated downstream traffic packets with a different one of the associated VLAN tags for the first VLAN region[[,]]<u>;</u> and

~~forwards~~ <u>means for forwarding</u> the duplicated downstream traffic packets to end users using the associated VLAN tags for the first VLAN region.

30. (Currently Amended) The VLAN Mapping Point of ~~claim 24~~ <u>claim 29</u>, wherein the first VLAN region is a last-mile network connecting the end user to the VLAN Mapping Point, and the second VLAN region is an aggregation network connecting a Layer 2 termination point to the VLAN Mapping Point.

31. (Previously Presented) The VLAN Mapping Point of claim 30, wherein the VLAN tag for the first VLAN region is a VLAN-per-user-per-service tag, and the VLAN tag for the second VLAN region is a VLAN-per-service tag.

32-36. (Canceled)